

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appellants: J. Tracy Weed et al.

Assignee: Synopsys, Inc.

Title: MANUFACTURING INTEGRATED CIRCUITS

Serial No.: 09/752,809 File Date: 12/27/2000

Examiner: Michael J. Fisher Art Unit: 3629

Docket No.: NTI-020(721)

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Mail Stop Appeal Brief-Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

APPEAL BRIEF

Sir:

This Appeal Brief, filed in triplicate, is in support of the Notice of Appeal dated March 2, 2007.

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I. REAL PARTY IN INTEREST

The real party in interest is the assignee, Synopsys, Inc., pursuant to the Assignments recorded in the U.S. Patent and Trademark Office on May 4, 2001 on Reel 011775, Frame 0822; September 5, 2001 on Reel 012152, Frame 0763; and February 4, 2005, on Reel 015653, Frame 0738.

II. RELATED APPEALS AND INTERFERENCES

Based on information and belief, there are no other appeals or interferences that could directly affect or be directly affected by or have a bearing on the decision by the Board of Patent Appeals in the pending appeal.

III. STATUS OF CLAIMS

Claims 1-25 and 28-71 are pending. Claims 1-25 and 28-71 stand rejected.

In the present paper, rejected Claims 1-25 and 28-71 are appealed.

Pending Claims 1-25 and 28-71 are listed in the Claims Appendix.

IV. STATUS OF AMENDMENTS

All claims amendments have been entered.

**V. SUMMARY OF CLAIMED SUBJECT MATTER**

As taught by Appellants, various approaches can be used to make masks, where the more expensive mask design approaches tend to yield superior results. Specification, page 2, lines 9-10. A current technique for creating superior mask design involves phase-shifting. Specification, page 2, lines 10-11. Unfortunately, creating phase-shifted masks tends to be expensive. Specification, page 3, lines 4-5.

The nature of semiconductor manufacturing is that only a relatively low percentage of integrated circuits are market "hits". Specification, page 3, lines 6-7. Indeed, most integrated circuits make little or no profit, and frequently do not result in enough revenue to even cover the cost of manufacture. Specification, page 3, lines 7-9. Unfortunately, it is not possible to determine whether an integrated circuit is going to be profitable or not before the IC is commercially introduced. Specification, page 3, lines 16-17.

One way to minimize a loss associated with a potentially non-profitable IC is to forego the additional expense of using phase-shifting technology in its manufacture. Specification, page 3, lines 22-24. Consequently, phase-shifting technology may be under-utilized even though its adoption would, on average, yield greater profits and better ICs. Specification, page 4, lines 7-9.

According to one claimed technique, a facilitator provides, on behalf of a set of one or more parties that desire masks, subsidies for production of phase-shifted masks. Specification, page 5, lines 3-4. The manufacture of the phase-shifted masks is paid using compensation that includes the subsidies from the facilitator. Specification, page 5,

lines 4-6. One or more mask makers manufacture the phase-shifted masks for the compensation. Specification, page 5, lines 6-7 and FIG. 3.

The facilitator receives, from the set of one or more parties, compensation for the subsidies based on one or more factors including a factor that reflects market success of integrated circuits produced using the phase-shifted masks. Specification, page 5, lines 8-9 and FIG. 4. As a result of using this technique, the various participants in the semiconductor industry benefit financially and at the same time the adoption of superior manufacturing techniques, i.e. phase-shifting, is accelerated. Specification, page 5, lines 15-17.

A concise explanation of the subject matter defined in each of the independent claims involved in the appeal (i.e. **Claims 1, 28, and 53**) and each dependent claim (i.e. **Claims 2, 4-7, 11, 14, 19-20, 22-24, 29, 31-34, 38, 41, 46-47, 49-51, 54, 56-59, 63, 66, and 70**) argued separately is provided below. This concise explanation refers to the specification by paragraph, page, and line numbers, and to the drawings, if any, by reference numbers.

**Claim 1.** A method of manufacturing phase-shifted masks, the method comprising the steps of:

providing, from a facilitator [FIG. 4: 310] on behalf of a set of one or more parties [FIG. 4: 304] that desire masks, subsidies for production of phase-shifted masks  
[Specification: page 10, lines 13-15];

paying for manufacture of said phase-shifted masks using compensation that includes said subsidies from said

facilitator [FIG. 4: 1, 2; Specification: page 10, lines 17-20];

manufacturing said phase-shifted masks for said compensation, said manufacturing being performed by a set of one or more mask makers [FIG. 4: 314, 4; Specification: page 11, lines 1-2]; and

receiving, by said facilitator from said set of one or more parties, compensation for said subsidies based on one or more factors including a factor that reflects market success of integrated circuits produced using said phase-shifted masks [FIG. 4: 5, 6, 7; Specification: page 9, line 12 to page 10, line 8].

**Claim 2.** The method of Claim 1 wherein, for a particular party in said set of one or more parties,

the facilitator agrees to provide subsidies for production of phase-shifted masks for a defined population of designs [Specification: page 17, lines 5-21]; and

the particular party agrees to compensate the facilitator for the subsidies based on a factor that reflects market success of each and every integrated circuit produced by or for said particular party based on any design in said defined population of designs [Specification: page 9, line 12 to page 10, line 8].

**Claim 4.** The method of Claim 1 wherein the step of compensating the facilitator includes a party from said set of one or more parties paying the facilitator based on number of integrated circuits manufactured using a phase-shifted mask that was subsidized by the facilitator [Specification: page 9, line 24 to page 10, line 2].

**Claim 5.** The method of Claim 1 wherein the step of compensating the facilitator includes a party from said set of one or more parties paying the facilitator for rental of a phase-shifted mask that was subsidized by the facilitator [Specification: page 9, lines 18-23].

**Claim 6.** The method of Claim 1 wherein the step of compensating the facilitator includes a party from said set of one or more parties paying the facilitator based on revenues derived from integrated circuits manufactured using a phase-shifted mask that was subsidized by the facilitator [Specification: page 9, lines 14-17].

**Claim 7.** The method of Claim 6 wherein the party pays the facilitator a per-unit amount that decreases with increased volume of sales of integrated circuits manufactured using said phase-shifted mask [Specification, page 10, lines 3-8].

**Claim 11.** The method of Claim 1 further comprising the step of the facilitator certifying mask makers that satisfy certain quality criteria [Specification, page 11, line 13 to page 12, line 4].

**Claim 14.** The method of Claim 13 further comprising the step of the facilitator determining which mask makers to certify based on said information [Specification, page 11, line 13 to page 12, line 4].

**Claim 19.** The method of Claim 1 further including the facilitator using a stepper simulation tool to determine flaws in said phase-shifted masks to be corrected [Specification, page 13, lines 1-13].

**Claim 20.** The method of Claim 19 further comprising the steps of:

the facilitator providing information about a particular phase-shifted mask acquired through the use of the stepper simulation tool to a semiconductor manufacturer [Specification, page 13, lines 1-15]; and

the semiconductor manufacturer adjusting parameters on an actual stepper that is used with the particular phase-shifted mask based on the information [Specification, page 13, lines 16-21].

**Claim 22.** The method of Claim 1 further comprising the step of the facilitator purchasing an option from a mask maker that commits the mask maker to perform a certain volume of future work for the facilitator [Specification, page 16, lines 1-7]; and

wherein the step of causing a set of one or more mask makers to manufacture said phase-shifted masks includes said facilitator exercising said option [Specification, page 16, lines 1-7].

**Claim 23.** The method of Claim 1 wherein:

the compensation for said subsidies is based on the number of semiconductors produced by said phase-shifted masks [Specification, page 9, lines 24-25]; and

the method further comprises the steps of using a counter installed on stepper equipment to determine the compensation [Specification, page 18, lines 15-21].

**Claim 24.** The method of Claim 1 wherein:  
the compensation for said subsidies is based on the number of semiconductors produced by said phase-shifted masks [Specification, page 9, lines 24-25]; and  
the method further comprises the steps of placing a counter device on at least one of the phase-shifted masks to determine the compensation [Specification, page 18, lines 22-26].

**Claim 28.** A method of manufacturing masks using a particular technology when said particular technology is preferable to but cost more than one or more alternative technologies, the method comprising the steps of:

providing, from a facilitator [FIG. 4: 310] on behalf of a set of one or more parties [FIG. 4: 304] that desire masks, subsidies for production of masks using said particular technology [Specification: page 10, lines 13-15];

paying for manufacture of said masks using compensation that includes said subsidies from said facilitator [FIG. 4: 1, 2; Specification: page 10, lines 17-20];

manufacturing said masks using said particular technology for said compensation, said manufacturing being performed by a set of one or more mask makers [FIG. 4: 314, 4; Specification: page 11, lines 1-2]; and

receiving, by said facilitator from said set of one or more parties, compensation for said subsidies based on one or more factors including a factor that reflects market success

of integrated circuits produced using said masks [FIG. 4: 5, 6, 7; Specification: page 9, line 12 to page 10, line 8].

**Claim 29.** The method of Claim 28 wherein, for a particular party in said set of one or more parties, the facilitator agrees to provide subsidies for production of masks for a defined population of designs [Specification: page 10, lines 13-15]; and the particular party agrees to compensate the facilitator for the subsidies based on a factor that reflects market success of each and every integrated circuit produced by or for said particular party based on any design in said defined population of designs [Specification: page 9, line 12 to page 10, line 8].

**Claim 31.** The method of Claim 28 wherein the step of compensating the facilitator includes a party from said set of one or more parties paying the facilitator based on number of integrated circuits manufactured using a mask that was subsidized by the facilitator [Specification, page 9, lines 24-25].

**Claim 32.** The method of Claim 28 wherein the step of compensating the facilitator includes a party from said set of one or more parties paying the facilitator for rental of a mask that was subsidized by the facilitator [Specification, page 9, lines 18-23].

**Claim 33.** The method of Claim 28 wherein the step of compensating the facilitator includes a party from said set of one or more parties paying the facilitator based on revenues

derived from integrated circuits manufactured using a mask that was subsidized by the facilitator [Specification, page 9, lines 14-17].

**Claim 34.** The method of Claim 33 wherein the party pays the facilitator a per-unit amount that decreases with increased volume of sales of integrated circuits manufactured using said mask [Specification, page 10, lines 3-8].

**Claim 38.** The method of Claim 28 further comprising the step of the facilitator certifying mask makers that satisfy certain quality criteria [Specification, page 11, line 13 to page 12, line 4].

**Claim 41.** The method of Claim 40 further comprising the step of the facilitator determining which mask makers to certify based on said information [Specification, page 11, line 13 to page 12, line 4].

**Claim 46.** The method of Claim 28 further including the facilitator using a stepper simulation tool to determine flaws in said masks to be corrected [Specification, page 13, lines 1-13].

**Claim 47.** The method of Claim 46 further comprising the steps of:

the facilitator providing information about a particular mask acquired through the use of the stepper simulation tool to a semiconductor manufacturer [Specification, page 13, lines 14-15]; and

the semiconductor manufacturer adjusting parameters on an actual stepper that is used with the particular mask based on the information [Specification, page 13, lines 16-21].

**Claim 49.** The method of Claim 28 further comprising the step of the facilitator purchasing an option from a mask maker that commits the mask maker to perform a certain volume of future work for the facilitator [Specification, page 16, lines 1-7]; and

wherein the step of causing a set of one or more mask makers to manufacture said masks includes said facilitator exercising said option [Specification, page 16, lines 1-7].

**Claim 50.** The method of Claim 28 wherein:  
the compensation for said subsidies is based on the number of semiconductors produced by said masks [Specification, page 9, lines 24-25]; and  
the method further comprises the steps of using a counter installed on stepper equipment to determine the compensation [Specification, page 18, lines 15-21].

**Claim 51.** The method of Claim 28 wherein:  
the compensation for said subsidies is based on the number of semiconductors produced by said masks [Specification, page 9, lines 24-25]; and  
the method further comprises the steps of placing a counter device on at least one of the masks to determine the compensation [Specification, page 18, lines 22-26].

**Claim 53.** A method of manufacturing products using a particular technology when said particular technology is

preferable to but cost more than one or more alternative technologies, the method comprising the steps of:

providing, from a facilitator [FIG. 4: 310] on behalf of a set of one or more parties [FIG. 4: 304], subsidies for using said particular technology to manufacture products;

paying for manufacture of said products using compensation that includes said subsidies from said facilitator [FIG. 4: 1, 2; Specification: page 10, lines 17-20];

manufacturing products for said compensation using said particular technology [FIG. 4: 314, 4; Specification: page 11, lines 1-2]; and

receiving, by said facilitator from said set of one or more parties, compensation for said subsidies based on one or more factors including a factor that reflects market success of said products [FIG. 4: 5, 6, 7; Specification: page 9, line 12 to page 10, line 8].

**Claim 54.** The method of Claim 53 wherein, for a particular party in said set of one or more parties,

the facilitator agrees to provide subsidies for production of products for a defined population of designs [Specification: page 10, lines 13-15]; and

the particular party agrees to compensate the facilitator for the subsidies based on a factor that reflects market success of each and every article of manufacture produced by or for said particular party based on any design in said defined population of designs [Specification: page 9, line 12 to page 10, line 8].

**Claim 56.** The method of Claim 53 wherein the step of compensating the facilitator includes a party from said set of one or more parties paying the facilitator based on number of articles of manufacture manufactured using a product that was subsidized by the facilitator [Specification, page 9, line 24 to page 10, line 2].

**Claim 57.** The method of Claim 53 wherein the step of compensating the facilitator includes a party from said set of one or more parties paying the facilitator for rental of a product that was subsidized by the facilitator [Specification, page 9, lines 18-23].

**Claim 58.** The method of Claim 53 wherein the step of compensating the facilitator includes a party from said set of one or more parties paying the facilitator based on revenues derived from articles of manufacture manufactured using a product that was subsidized by the facilitator [Specification, page 9, lines 14-17].

**Claim 59.** The method of Claim 58 wherein the party pays the facilitator a per-unit amount that decreases with increased volume of sales of articles of manufacture manufactured using said product [Specification, page 10, lines 3-8].

**Claim 63.** The method of Claim 53 further comprising the step of the facilitator certifying product makers that satisfy certain quality criteria [Specification, page 11, line 13 to page 12, line 4].

**Claim 66.** The method of Claim 65 further comprising the step of the facilitator determining which product makers to certify based on said information [Specification, page 11, line 13 to page 12, line 4].

**Claim 70.** The method of Claim 53 further comprising the step of the facilitator purchasing an option from a product maker that commits the product maker to perform a certain volume of future work for the facilitator [Specification, page 16, lines 1-7]; and

wherein the step of causing a set of one or more product makers to manufacture said products includes said facilitator exercising said option [Specification, page 16, lines 1-7].

#### VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The following issues are presented to the Board of Appeals for decision:

(A) Whether Claims 1-25 and 28-71 are patentable under 35 U.S.C. 103(a) over "National Security And the Semiconductor Industry (Dallmeyer).

#### VII. ARGUMENTS

A. Claims 1-25 and 28-71 are patentable under 35 U.S.C. 103(a) over "National Security And The Semiconductor Industry" (Dallmeyer)

##### 1. Dallmeyer: Overview

Dallmeyer criticizes Sematech, the industry consortium intended to restore U.S. competitiveness in the early 1990s

with partial DOD funding. Section, "Real Problems, Wrong Answers", 1<sup>st</sup> and 2<sup>nd</sup> paragraphs. Thirteen chip producers, e.g. AMD, Digital, HP, IBM, National Semiconductor, and TI, agreed to participate subject to government funding and approval by company management. Section, "Sematech: The Main Act", 3<sup>rd</sup> paragraph. The Semiconductor Industry Association (SIA) rejected the option of Sematech manufacturing commercial quantities of chip. Section, "Sematech: The Main Act", 5<sup>th</sup> paragraph. Thus, chips produced by Sematech would be used only in testing and quality control - none would be sold. Section, "Sematech: The Main Act", 5<sup>th</sup> paragraph.

Dallmeyer believes that by partially funding Sematech the DOD would be repeating earlier government mistakes in protecting declining domestic industries. Section, "Real Problems, Wrong Answers", 2<sup>nd</sup> paragraph. Dallmeyer further believes that Sematech would encourage the foreign competition to manufacture products that are more advanced and more lucrative. Section, "Real Problems, Wrong Answers", 6<sup>th</sup> paragraph. Dallmeyer yet further believes that Sematech could easily metamorphose into yet another captive defense industry with a voracious appetite for increasing appropriations. Section, "Real Problems, Wrong Answers", 10<sup>th</sup> paragraph. For these and other reasons, Dallmeyer concludes that there may be cheaper, more efficient ways to stimulate civilian R&D than the Sematech consortium. Section, "Facing the Long Term".

**2. Limitations recited in Claims 1-25 and 28-71 are not taught by Dallmeyer.**

**(a) Claims 1, 28, and 53**

Claim 1 recites in part:

receiving, by said facilitator from said set of one or more parties, compensation for said subsidies based on one or more factors including a factor that reflects market success of integrated circuits produced using said phase-shifted masks.

Claim 28 recites in part:

receiving, by said facilitator from said set of one or more parties, compensation for said subsidies based on one or more factors including a factor that reflects market success of integrated circuits produced using said masks.

Claim 53 recites in part:

receiving, by said facilitator from said set of one or more parties, compensation for said subsidies based on one or more factors including a factor that reflects market success of said products.

Appellants respectfully submit that Dallmeyer fails to disclose or suggest these limitations. Specifically, Appellants respectfully submit that Dallmeyer fails to teach a facilitator that receives compensation for subsidies as well as the compensation for the subsidies being based on factors including market success. The recited steps advantageously allow mask makers, the mask requesters, as well as the facilitator to benefit financially from using a developing technology, such as phase-shifting technology.

The Examiner cites Dallmeyer at page 2, lines 44-46 (shown below) as teaching Claims 1, 28, and 53.

The same issues that arose in the Fujitsu-Fairchild case underlie the industry's proposal that the government subsidize Sematech, a new consortium intended to restore U.S. competitiveness by the early 1990s.

Appellants traverse this characterization. As taught by Dallmeyer, Section "Sematech: The Main Act", 3<sup>rd</sup> paragraph (shown below) :

Consortium members will supply money and staff to Semantech in exchange for access to the resulting manufacturing technology. To fund the venture, the SIA is seeking \$125 million annually from industry and a matching amount from the federal government, primarily DOD, for six years.

As further taught by Dallmeyer, Section "Sematech: The Main Act", 5<sup>th</sup> paragraph (shown below) :

Although a high-volume production line is the best way to test manufacturing techniques and drive down costs, Sematech will combine a medium-scale plant with elaborate software programs. These would give manufacturers the flexibility needed to produce complex and customized chips. The SIA rejected the option of having Sematech manufacture commercial quantities. The decision for small volume was reportedly a concession to obtain IBM's support of the project. IBM feared it would be pressured into buying Sematech's chips, even if other chips of better quality or lower cost were available. Chips coming off the production line will be used only in testing and quality control - none will be sold.

Therefore, the Semantech process is distinguished from the recited methods. Because Dallmeyer fails to disclose or suggest receiving, by said facilitator from the party (parties), compensation for the subsidies based on one or more factors including a factor that reflects market success of integrated circuits (products) produced using said phase-shifted masks (masks or particular technology), Appellants request reconsideration and withdrawal of the rejection of Claims 1, 28, and 53.

**(b) Claims 2-25, 29-52, 54-71**

Claims 2-25 depend from Claim 1 and therefore are patentable for at least the reasons presented for Claim 1. Claims 29-52 depend from Claim 28 and therefore are patentable for at least the reasons presented for Claim 28. Claims 54-71 depend from Claim 53 and therefore are patentable for at least the reasons presented for Claim 53. Based on those reasons, Appellants request reconsideration and withdrawal of the rejection of Claims 2-25, 29-52, and 54-71.

**(c) Claims 2, 29, and 54**

Moreover, Claims 2, 29, and 54 recite in part:

the particular party agrees to compensate the facilitator for the subsidies based on a factor that reflects market success of each and every integrated circuit produced by or for said particular party based on any design in said defined population of designs.

Dallmeyer teaches nothing about the parties (e.g. members of the consortium) compensating the facilitator (e.g. the DOD), much less compensating based on a factor reflecting the market success of the integrated circuits produced by or for the parties. Therefore, Appellants request further reconsideration and withdrawal of the rejection of Claims 2, 29, and 54.

**(d) Claims 4, 31, and 56**

Moreover, Claim 4 recites, "wherein the step of compensating the facilitator includes a party from said set of one or more parties paying the facilitator based on number of integrated circuits manufactured using a phase-shifted mask that was subsidized by the facilitator"; Claim 31 recites,

"wherein the step of compensating the facilitator includes a party from said set of one or more parties paying the facilitator based on number of integrated circuits manufactured using a mask that was subsidized by the facilitator"; and Claim 56 recites, "wherein the step of compensating the facilitator includes a party from said set of one or more parties paying the facilitator based on number of articles of manufacture manufactured using a product that was subsidized by the facilitator".

Dallmeyer teaches nothing about a party (e.g. a consortium member) compensating the facilitator (e.g. the DOD) based on the number of ICs manufactured using a phase-shifted mask. Therefore, Appellants request further reconsideration and withdrawal of the rejection of Claims 4, 31, and 56.

**(e) Claims 5, 32, and 57**

Moreover, Claim 5 recites, "wherein the step of compensating the facilitator includes a party from said set of one or more parties paying the facilitator for rental of a phase-shifted mask that was subsidized by the facilitator"; Claim 32 recites, "wherein the step of compensating the facilitator includes a party from said set of one or more parties paying the facilitator for rental of a mask that was subsidized by the facilitator"; and Claim 57 recites, "wherein the step of compensating the facilitator includes a party from said set of one or more parties paying the facilitator for rental of a product that was subsidized by the facilitator". Dallmeyer teaches nothing about a party (e.g. a consortium member) paying the facilitator (e.g. the DOD) for a rental of a phase-shifted mask/mask/product that was subsidized.

Therefore, Appellants request further reconsideration and withdrawal of the rejection of Claims 5, 32, and 57.

**(f) Claims 6, 33, and 58**

Moreover, Claim 6 recites, "wherein the step of compensating the facilitator includes a party from said set of one or more parties paying the facilitator based on revenues derived from integrated circuits manufactured using a phase-shifted mask that was subsidized by the facilitator"; Claim 33 recites, "wherein the step of compensating the facilitator includes a party from said set of one or more parties paying the facilitator based on revenues derived from integrated circuits manufactured using a mask that was subsidized by the facilitator"; and Claim 58 recites, "wherein the step of compensating the facilitator includes a party from said set of one or more parties paying the facilitator based on revenues derived from articles of manufacture manufactured using a product that was subsidized by the facilitator". Dallmeyer teaches nothing about a party (e.g. a consortium member) paying the facilitator (e.g. the DOD) based on revenues. Therefore, Appellants request further reconsideration and withdrawal of the rejection of Claims 6, 33, and 58.

**(g) Claims 7, 34, and 59**

Moreover, Claim 7 recites, "wherein the party pays the facilitator a per-unit amount that decreases with increased volume of sales of integrated circuits manufactured using said phase-shifted mask"; Claim 34 recites, "wherein the party pays the facilitator a per-unit amount that decreases with increased volume of sales of integrated circuits manufactured using said mask"; and Claim 59 recites, "wherein the party

pays the facilitator a per-unit amount that decreases with increased volume of sales of articles of manufacture manufactured using said product". Dallmeyer teaches nothing about a party (e.g. a consortium member) paying the facilitator (e.g. the DOD) based on a per-unit amount or based on the number of ICs/articles of manufacture. Therefore, Appellants request further reconsideration and withdrawal of the rejection of Claims 7, 34, and 59.

**(h) Claims 20 and 47**

Moreover, Claim 20 recites, "the facilitator providing information about a particular phase-shifted mask acquired through the use of the stepper simulation tool to a semiconductor manufacturer; and the semiconductor manufacturer adjusting parameters on an actual stepper that is used with the particular phase-shifted mask based on the information". Claim 47 recites, "the facilitator providing information about a particular mask acquired through the use of the stepper simulation tool to a semiconductor manufacturer; and the semiconductor manufacturer adjusting parameters on an actual stepper that is used with the particular mask based on the information". Dallmeyer teaches nothing about using a stepper simulation tool in this manner and then adjusting parameters on the stepper. Therefore, Appellants request further reconsideration and withdrawal of the rejection of Claims 20 and 47.

**(i) Claims 22, 49, and 70**

Moreover, Claim 22 recites, "the facilitator purchasing an option from a mask maker that commits the mask maker to perform a certain volume of future work for the facilitator;

and ... said facilitator exercising said option"; Claim 49 recites, "the facilitator purchasing an option from a mask maker that commits the mask maker to perform a certain volume of future work for the facilitator; and ... said facilitator exercising said option"; and Claim 70 recites, "the facilitator purchasing an option from a product maker that commits the product maker to perform a certain volume of future work for the facilitator; and ... said facilitator exercising said option". Dallmeyer teaches nothing about a facilitator purchasing and exercising an option. Therefore, Appellants request further reconsideration and withdrawal of the rejection of Claims 22, 49, and 70.

**(j) Claims 23, 24, 50, and 51**

Claims 23, 24, 50, and 51 recite using a counter/counter device on the stepper equipment/phase-shifted mask/mask to determine the compensation for the subsidies. Dallmeyer teach nothing about using a counter/counter device to determine compensation for a subsidy. Therefore, Appellants request further reconsideration and withdrawal of the rejection of Claims 23, 24, 50, and 51.

**B. The Examiner has failed to present a prima facie case of obviousness. Specifically, the Examiner has relied on hindsight to reject the claims.**

Dallmeyer fails to teach a facilitator that receives compensation for subsidies as well as the compensation for subsidies being based on factors including market success. To make up for these deficiencies and other deficiencies, e.g. other limitations in the dependent claims (noted above), the

Examiner repeatedly states that the recited limitations are "inherent" or "obvious to one of ordinary skill in the art". Notably, no other reference is cited to support the Examiner's bald assertion of inherency/obviousness.

The Final Office Action (e.g. on page 6, Response to Arguments) repeats that Dallmeyer does not disclose all limitations. The Final Office Action then states that "Applicant does not argue against the examiner's rationale for making the limitations not found obvious". Appellants disagree.

In fact, Appellants have repeatedly emphasized the lack of rationale in the Examiner's arguments. For example, in the "Amendment In Response To Second Office Action" dated August 15, 2006, Appellants provided citations in Dallmeyer that clearly teach a different process than that recited in the claims, thereby demonstrating the lack of inherency or obviousness to use Dallmeyer to teach Applicants' recited methods. See, e.g. pages 30-31. Appellants further argued in this same paper that the lack of support in Dallmeyer for the claim rejections actually reflects the Examiner's use of hindsight, which cannot be used in the rejection of the claims. See, page 37.

As succinctly stated by the Federal Circuit, the "prior art must suggest to one of ordinary skill in the art the desirability of the claimed combination". *Fromsom v. Advance Offset Plate, Inc.*, 755 F.2d 1549, 1556 (Fed.Cir. 1985). Moreover, as also stated by the Federal Circuit, even "when obviousness is based on a single prior art reference, there must be a showing of a suggestion or motivation to modify the teachings of that reference". *In re Kotzab*, 217 F.3d 1365, 1370 (Fed.Cir. 2000).

Appellants submit that the Examiner has used the claimed invention as a blueprint for fabricating the allegedly "inherent" or "obvious" elements to defeat the patentability of the claimed invention. That is, Dallmeyer teaches nothing about the facilitator receiving compensation for subsidies or compensation for subsidies being based on factors including a factor that reflects market success. Thus, Dallmeyer provides no suggestion or motivation to modify its teachings in the manner recited in the recited claims.

The Examiner has cited no other references in the Final Office Action. Therefore, the only way to modify the teaching of Dallmeyer in the manner recited in the claims is by using hindsight, which cannot be used to reject the claims.

#### C. CONCLUSION

For the foregoing reasons, it is submitted that the Examiner's rejections of Claims 1-25 and 28-71 are erroneous, and reversal of these rejections is respectfully requested.

Respectfully submitted,



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## VIII. CLAIMS APPENDIX

1. (Previously Presented) A method of manufacturing phase-shifted masks, the method comprising the steps of:
  - providing, from a facilitator on behalf of a set of one or more parties that desire masks, subsidies for production of phase-shifted masks;
  - paying for manufacture of said phase-shifted masks using compensation that includes said subsidies from said facilitator;
  - manufacturing said phase-shifted masks for said compensation, said manufacturing being performed by a set of one or more mask makers; and
  - receiving, by said facilitator from said set of one or more parties, compensation for said subsidies based on one or more factors including a factor that reflects market success of integrated circuits produced using said phase-shifted masks.
2. (Original) The method of Claim 1 wherein, for a particular party in said set of one or more parties,
  - the facilitator agrees to provide subsidies for production of phase-shifted masks for a defined population of designs; and
  - the particular party agrees to compensate the facilitator for the subsidies based on a factor that reflects market success of each and every integrated circuit produced by or for said particular party based on any design in said defined population of designs.
3. (Original) The method of Claim 1 wherein:

the phase-shifted masks include a phase-shifted mask for a particular design;

manufacture of a mask for said particular design using an alternative technology would cost X;

manufacture of the phase-shifted mask for the particular design costs Y, where Y is greater than X; and

the step of providing subsidies includes providing a subsidy that is substantially equal to Y-X for manufacture of said phase-shifted mask for said particular design.

4. (Original) The method of Claim 1 wherein the step of compensating the facilitator includes a party from said set of one or more parties paying the facilitator based on number of integrated circuits manufactured using a phase-shifted mask that was subsidized by the facilitator.

5. (Original) The method of Claim 1 wherein the step of compensating the facilitator includes a party from said set of one or more parties paying the facilitator for rental of a phase-shifted mask that was subsidized by the facilitator.

6. (Original) The method of Claim 1 wherein the step of compensating the facilitator includes a party from said set of one or more parties paying the facilitator based on revenues derived from integrated circuits manufactured using a phase-shifted mask that was subsidized by the facilitator.

7. (Original) The method of Claim 6 wherein the party pays the facilitator a per-unit amount that decreases with increased volume of sales of integrated circuits manufactured using said phase-shifted mask.

8. (Original) The method of Claim 1 wherein the set of one or more parties includes a plurality of parties.

9. (Original) The method of Claim 1 wherein the set of one or more mask makers includes a plurality of mask makers.

10. (Original) The method of Claim 8 wherein the set of one or more mask makers includes a plurality of mask makers.

11. (Original) The method of Claim 1 further comprising the step of the facilitator certifying mask makers that satisfy certain quality criteria.

12. (Original) The method of Claim 1 further comprising the step of the facilitator selecting the one or more mask makers to manufacture said phase-shifted masks.

13. (Original) The method of Claim 1 further comprising the step of the facilitator gathering information about jobs performed by mask makers, wherein said one or more mask makers are selected to manufacture said phase-shifted masks based on said information.

14. (Original) The method of Claim 13 further comprising the step of the facilitator determining which mask makers to certify based on said information.

15. (Original) The method of Claim 13 wherein the information includes information from the mask makers about reticles that they produce.

16. (Original) The method of Claim 15 further comprising the step of the facilitator causing the mask maker to encode information about a particular reticle onto the particular reticle.

17. (Original) The method of Claim 1 further comprising the step of the facilitator performing one or more quality assurance tests on said phase-shifted masks.

18. (Original) The method of Claim 17 wherein the step of performing one or more quality assurance tests is performed for a given phase-shifted mask prior to the facilitator releasing said given phase-shifted mask to be used by a semiconductor manufacturer.

19. (Previously Presented) The method of Claim 1 further including the facilitator using a stepper simulation tool to determine flaws in said phase-shifted masks to be corrected.

20. (Original) The method of Claim 19 further comprising the steps of:

the facilitator providing information about a particular phase-shifted mask acquired through the use of the stepper simulation tool to a semiconductor manufacturer; and

the semiconductor manufacturer adjusting parameters on an actual stepper that is used with the particular phase-shifted mask based on the information.

21. (Original) The method of Claim 1 further comprising the step of the facilitator obtaining a volume discount from a

mask manufacturer based on a contract in which the facilitator agrees to use the mask manufacturer to produce phase-shifted masks for a plurality of semiconductor manufacturers.

22. (Original) The method of Claim 1 further comprising the step of the facilitator purchasing an option from a mask maker that commits the mask maker to perform a certain volume of future work for the facilitator; and

wherein the step of causing a set of one or more mask makers to manufacture said phase-shifted masks includes said facilitator exercising said option.

23. (Original) The method of Claim 1 wherein:  
the compensation for said subsidies is based on the number of semiconductors produced by said phase-shifted masks; and

the method further comprises the steps of using a counter installed on stepper equipment to determine the compensation.

24. (Original) The method of Claim 1 wherein:  
the compensation for said subsidies is based on the number of semiconductors produced by said phase-shifted masks; and  
the method further comprises the steps of placing a counter device on at least one of the phase-shifted masks to determine the compensation.

25. (Original) The method of Claim 1 further comprising the step of facilitator causing designs of at least some of the integrated circuits produced using said phase-shifted masks to be watermarked.

26. (Cancelled)

27. (Cancelled)

28. (Previously Presented) A method of manufacturing masks using a particular technology when said particular technology is preferable to but cost more than one or more alternative technologies, the method comprising the steps of:

providing, from a facilitator on behalf of a set of one or more parties that desire masks, subsidies for production of masks using said particular technology;

paying for manufacture of said masks using compensation that includes said subsidies from said facilitator;

manufacturing said masks using said particular technology for said compensation, said manufacturing being performed by a set of one or more mask makers; and

receiving, by said facilitator from said set of one or more parties, compensation for said subsidies based on one or more factors including a factor that reflects market success of integrated circuits produced using said masks.

29. (Original) The method of Claim 28 wherein, for a particular party in said set of one or more parties,

the facilitator agrees to provide subsidies for production of masks for a defined population of designs; and

the particular party agrees to compensate the facilitator for the subsidies based on a factor that reflects market success of each and every integrated circuit produced by or for said particular party based on any design in said defined population of designs.

30. (Original) The method of Claim 28 wherein:  
the masks include a mask for a particular design;  
manufacture of a mask for said particular design using an  
alternative technology would cost X;

manufacture of the mask for the particular design using  
said particular technology costs Y, where Y is greater than X;  
and

the step of providing subsidies includes providing a  
subsidy that is substantially equal to Y-X for manufacture of  
said mask for said particular design using said particular  
technology.

31. (Original) The method of Claim 28 wherein the step of  
compensating the facilitator includes a party from said set of  
one or more parties paying the facilitator based on number of  
integrated circuits manufactured using a mask that was  
subsidized by the facilitator.

32. (Original) The method of Claim 28 wherein the step of  
compensating the facilitator includes a party from said set of  
one or more parties paying the facilitator for rental of a  
mask that was subsidized by the facilitator.

33. (Original) The method of Claim 28 wherein the step of  
compensating the facilitator includes a party from said set of  
one or more parties paying the facilitator based on revenues  
derived from integrated circuits manufactured using a mask  
that was subsidized by the facilitator.

34. (Original) The method of Claim 33 wherein the party pays the facilitator a per-unit amount that decreases with increased volume of sales of integrated circuits manufactured using said mask.

35. (Original) The method of Claim 28 wherein the set of one or more parties includes a plurality of parties.

36. (Original) The method of Claim 28 wherein the set of one or more mask makers includes a plurality of mask makers.

37. (Original) The method of Claim 35 wherein the set of one or more mask makers includes a plurality of mask makers.

38. (Original) The method of Claim 28 further comprising the step of the facilitator certifying mask makers that satisfy certain quality criteria.

39. (Original) The method of Claim 28 further comprising the step of the facilitator selecting the one or more mask makers to manufacture said masks.

40. (Original) The method of Claim 28 further comprising the step of the facilitator gathering information about jobs performed by mask makers, wherein said one or more mask makers are selected to manufacture said masks based on said information.

41. (Original) The method of Claim 40 further comprising the step of the facilitator determining which mask makers to certify based on said information.

42. (Original) The method of Claim 40 wherein the information includes information from the mask makers about reticles that they produce.

43. (Original) The method of Claim 42 further comprising the step of the facilitator causing the mask maker to encode information about a particular reticle onto the particular reticle.

44. (Original) The method of Claim 28 further comprising the step of the facilitator performing one or more quality assurance tests on said masks.

45. (Original) The method of Claim 44 wherein the step of performing one or more quality assurance tests is performed for a given mask prior to the facilitator releasing said given mask to be used by a semiconductor manufacturer.

46. (Previously Presented) The method of Claim 28 further including the facilitator using a stepper simulation tool to determine flaws in said masks to be corrected.

47. (Original) The method of Claim 46 further comprising the steps of:

the facilitator providing information about a particular mask acquired through the use of the stepper simulation tool to a semiconductor manufacturer; and

the semiconductor manufacturer adjusting parameters on an actual stepper that is used with the particular mask based on the information.

48. (Original) The method of Claim 28 further comprising the step of the facilitator obtaining a volume discount from a mask manufacturer based on a contract in which the facilitator agrees to use the mask manufacturer to produce masks for a plurality of semiconductor manufacturers.

49. (Original) The method of Claim 28 further comprising the step of the facilitator purchasing an option from a mask maker that commits the mask maker to perform a certain volume of future work for the facilitator; and

wherein the step of causing a set of one or more mask makers to manufacture said masks includes said facilitator exercising said option.

50. (Original) The method of Claim 28 wherein:  
the compensation for said subsidies is based on the number of semiconductors produced by said masks; and  
the method further comprises the steps of using a counter installed on stepper equipment to determine the compensation.

51. (Original) The method of Claim 28 wherein:  
the compensation for said subsidies is based on the number of semiconductors produced by said masks; and  
the method further comprises the steps of placing a counter device on at least one of the masks to determine the compensation.

52. (Original) The method of Claim 28 further comprising the step of facilitator causing designs of at least some of

the integrated circuits produced using said masks to be watermarked.

53. (Previously Presented) A method of manufacturing products using a particular technology when said particular technology is preferable to but cost more than one or more alternative technologies, the method comprising the steps of:

providing, from a facilitator on behalf of a set of one or more parties, subsidies for using said particular technology to manufacture products;

paying for manufacture of said products using compensation that includes said subsidies from said facilitator;

manufacturing products for said compensation using said particular technology; and

receiving, by said facilitator from said set of one or more parties, compensation for said subsidies based on one or more factors including a factor that reflects market success of said products.

54. (Original) The method of Claim 53 wherein, for a particular party in said set of one or more parties,

the facilitator agrees to provide subsidies for production of products for a defined population of designs; and

the particular party agrees to compensate the facilitator for the subsidies based on a factor that reflects market success of each and every article of manufacture produced by or for said particular party based on any design in said defined population of designs.

55. (Original) The method of Claim 53 wherein:  
the products include a product for a particular design;  
manufacture of a product for said particular design using  
an alternative technology would cost X;

manufacture of the product for the particular design  
using said particular technology costs Y, where Y is greater  
than X; and

the step of providing subsidies includes providing a  
subsidy that is substantially equal to Y-X for manufacture of  
said product for said particular design using said particular  
technology.

56. (Original) The method of Claim 53 wherein the step of  
compensating the facilitator includes a party from said set of  
one or more parties paying the facilitator based on number of  
articles of manufacture manufactured using a product that was  
subsidized by the facilitator.

57. (Original) The method of Claim 53 wherein the step of  
compensating the facilitator includes a party from said set of  
one or more parties paying the facilitator for rental of a  
product that was subsidized by the facilitator.

58. (Original) The method of Claim 53 wherein the step of  
compensating the facilitator includes a party from said set of  
one or more parties paying the facilitator based on revenues  
derived from articles of manufacture manufactured using a  
product that was subsidized by the facilitator.

59. (Original) The method of Claim 58 wherein the party  
pays the facilitator a per-unit amount that decreases with

increased volume of sales of articles of manufacture manufactured using said product.

60. (Original) The method of Claim 53 wherein the set of one or more parties includes a plurality of parties.

61. (Original) The method of Claim 53 wherein the set of one or more product makers includes a plurality of product makers.

62. (Original) The method of Claim 60 wherein the set of one or more product makers includes a plurality of product makers.

63. (Original) The method of Claim 53 further comprising the step of the facilitator certifying product makers that satisfy certain quality criteria.

64. (Original) The method of Claim 53 further comprising the step of the facilitator selecting the one or more product makers to manufacture said products.

65. (Original) The method of Claim 53 further comprising the step of the facilitator gathering information about jobs performed by product makers, wherein said one or more product makers are selected to manufacture said products based on said information.

66. (Original) The method of Claim 65 further comprising the step of the facilitator determining which product makers to certify based on said information.

67. (Original) The method of Claim 53 further comprising the step of the facilitator performing one or more quality assurance tests on said products.

68. (Original) The method of Claim 67 wherein the step of performing one or more quality assurance tests is performed for a given product prior to the facilitator releasing said given product to said one or more parties.

69. (Original) The method of Claim 53 further comprising the step of the facilitator obtaining a volume discount from a product manufacturer based on a contract in which the facilitator agrees to use the product manufacturer to produce products for a plurality of said one or more parties.

70. (Original) The method of Claim 53 further comprising the step of the facilitator purchasing an option from a product maker that commits the product maker to perform a certain volume of future work for the facilitator; and

wherein the step of causing a set of one or more product makers to manufacture said products includes said facilitator exercising said option.

71. (Original) The method of Claim 53 further comprising the step of facilitator causing designs of at least some of the articles of manufacture produced using said products to be watermarked.

IX. EVIDENCE APPENDIX

None

**X. RELATED PROCEEDINGS APPENDIX**

None